Engineering Standards Update

News from Engineering Standards Program

Dec 12, 2024

Standards are serious business but this newsletter isn't always.

Topics this month:

Wishing you and your family a Merry Christmas and other Happy Holidays!

STANDARDS SPOTLIGHT: VAR-10694, Project Drawing Package Approvals on Title Sheet; Fewer Signatures

For a large drawing package, authenticated electronic signatures and the certificate verifications they trigger can result in a several hour task for the Facility Design Authority Representative (FDAR; normally last signature on sheets). This is encountered in both the issued-for construction (IFC) set phase and record drawing set approval phase. VAR-10694, issued on Nov 19, 2024, establishes an expectation on the Design Agency to support this approach for new project starts, effectively immediately. For projects underway, we ask that they adopt the method as well.

This Variance modifying CAD Standards Manual Section 200 reduces the number of signatures in a drawing package by moving many digital signatures to the title sheet to represent approval of all sheets in a package, and use of typed names on the remainder of the sheets. Eligible drawing packages must include a title sheet. Concurrently, the LBO signature on drawings is eliminated (approval captured elsewhere). This approach will usually result in no more than two authenticated signatures per sheet in a drawing package; this will save a significant amount of time. The variance includes detailed instructions and graphics describing the process, which will require new approaches for the Design Agency, Project Engineer, FDAR, and Document Control (EDRMS handling). Usage is limited to ML-4 and non-nuclear projects, ML-3 work for pilot purposes.

Many thanks to Landry Milnes, ES-WFO FDAR and others for the initiative; Tobin Oruch for authoring; Brandon Rael, Arch POC for the CAD work; David Smith, LBO Design Package Reviewer (aka Permitting Desk); Michael Gallegos CSM POC, and others who provided input.

SEISMIC DESIGN PARAMETERS UPDATE

VAR-10711 implements ES-DO-Memo-24-022, Rev. 1, which provides LANL Interim Seismic Design Parameters that are to be used for SDC-1, SDC-2 and Non-nuclear SSCs until the next PSHA update becomes available. The variance also eliminates the use of Seismic Design Category (SDC) C. These changes impact the following documents:

- ESM Chapter 5, Sections II.1.8.A.1 and II.1.8.A.2
- TSM Chapter 5, Sections 3.A.1 and 3.A.2
- ESM Chapter 16, IBC-GEN, Att. B
- All other LANL Master Specification Sections and Standard Drawings and Details that refer to the old seismic design parameters.

These updated interim coefficients apply to new designs that establish their Code of Record beginning December 11th, 2024. For projects underway in Title I or II, Project Management should evaluate and determine whether the adoption of the interim parameters is appropriate.

Thanks to Structural POC Carlos Coronado, Seismic Program Manager Eric MacFarlane, Neha Gidwani, Matthew LaCome, Tobin Oruch et. al.

TRAINING & QUALIFICATION

Courses, Seminars, Programs

Note on Training Registration emails: When you sign up for a class in UTrain, you will receive an email that is generated by UTrain upon registration and again on the day of or before the class which will include the link to join the Teams meeting (for classes hosted online). **WARNING: To get the Teams link email you must register in UTrain. The email will NOT automatically enter an event on your calendar in Outlook. Please block your own calendar.** To receive credit for the course, you are required to log into the Teams meeting using a computer that has voice and chat capabilities (for classes hosted online). Do not use a mobile device to join the class; if you do so you will not be able to receive credit. For any questions, please email the Training team at es-do-tng@lanl.gov.

PSO Overview, #52955 – Jan 6 - 9, 13-16 (must attend all sessions), 2:00-3:30 pm, Teams

Ari Swartz is leading this instructor-led course to familiarize participants with pressure safety concepts that a Pressure Safety Officer (PSO) needs an understanding of to perform the roles and responsibilities of being a PSO in an interim capacity.

CoE ESM Chapter 21 Software – Overview and Owners Courses – series is Jan 14 and 16, Teams

A few of you are new "Owners" of nuclear safety or other ML-1, -2, or -3 software (installed in a system, or maybe for design/analysis). If you follow ESM Chapter 21 Software, then you need to take training on the chapter. The managers (including FDARs) of Owners only need the overview.

So…if you, in fact, need training, please register in UTrain for the course(s) below. If you're not sure what you need, contact SME/instructor Jared Harris. **Note the UTrain notification states 2 hours. Block 3 hours in your calendar.**

- 38047 CoE ESM Chapter 21 Software Overview, 3 hours. (RLMs and Owners): Tuesday, Jan 14, from 9 am - 12 pm.
- 34048 CoE ESM Chapter 21 Software Owners (3 additional hours, just Owners return for this): Thursday, Jan 16, also from 9 am - 12 pm.

CoE: Design Engineer ES-EPD Article 250 Conductors Duty Area 9, #55880 – Jan 16, 9:00-11:00 am, Teams

Eric Stromberg is leading this instructor-led course. It is required for completion of Duty Area 9 for DE qualification of Electrical Engineers (per UTrain curricula 14186).

CoE Commercial Grade Dedication (CGD) - Preparers Course #30727 – Jan 30, 8:00 am - 4:00 pm, Teams

For those of you who will serve as LANL CGD Preparers including Procurement engineers, select CSEs and Quality SMEs, Course #30727 is required (#30726 is a prerequisite). **NOTE: Historically, this course is only offered twice a year, so plan accordingly!**

For any questions, contact instructor John Lamendola.

CoE: Design Engineer Over-Current Protection Duty Area 9, #58192 – Jan 30, 9:00-11:00 am, Teams

Eric Stromberg is leading this instructor-led course. It is required for completion of Duty Area 9 for DE qualification of Electrical Engineers (per UTrain curricula 14186).

Onboarding Training Courses by CoE Office, Teams:

- COE ES LANL Organization and Engineering Divisions Introduction #54659, Dec 18, 10.30 - 11.30 am
- AP Introduction and Common APs Deep Dive #54871, Jan 9, 10 - 11.30 am.

RASSTI/ROSY Training by Research Library, Dec 17, 10:00-11:00 am, Teams

This training will cover everything you need to know to submit to RASSTI or ROSY including a demo of submitting to each application, when to use RASSTI or ROSY, expected turnaround time to receive your LA-UR/LA-CP, how to get DUSA trained and new CUI options in RASSTI.

Training by IQPA, Teams (Instructor led):

- Nonconformance Control & reporting Coordinator (NCRC), #57109, 1st Wed each month, 1.00 - 3.00 pm
- Nonconformance Control & Reporting Owner Manager (NCR OM), #58013, 2nd Wed each month, 1.00 - 3.00 pm.
  Pre-requisites for the courses are UTrain Course #44790, Nonconformance Reporting Overview & Required Reading #56362, Nonconformance Control and Reporting.

T&Q Admin matters

E-mail for CoE Training: es-do-tng@lanl.gov
Click e-mail address above for help with COE training issues like getting registered, missing credit, etc. Goes to the whole team: Stan Hayes, Nick Jones, Sadonna Tapia, Santana Quintana, and Chris Martinez. Alternatively, visit the Engineering Services Training and Qualifications webpage by clicking the button "Email The Training Team". The Training and Qualifications webpage contains information and tools on training requirements and copies of the various Qualification Standards maintained by the COE office.

E-mail for CoE Qual Program: COEQuals@lanl.gov
Click e-mail address above for any help with COE quals such as CSE, PrE, Design, Project, PSO, FDAR, and other qualified positions (and also SHR matters for CSEs). Goes to Deb Cushner, Jess Blea, and Barb Dela Cruz.

Instructor-Led Course Request/Registration Guide
For live courses without a session in UTrain, there's a step-by-step guide posted to the CoE T&Q "Resources" page on how to request a course. This places the requestor on the waitlist and notifies the training team of interest for the said live course.

LANL ENGINEERING STANDARDS ISSUED IN NOVEMBER OR SO

Engineering Standards Manual ESM STD-342-100

Chapter	Section	Title	Rev.	Date	Comments
Ch 1 - General	200, 210 & 230, Attachment 1	MEL/CMMS Upload Workbook (LANL Only)	2	12/03/2024	Added Required/When Applicable/Optional fields data; new CMMS Entry View Tab (maps data from XLS Entry Tab to appear in the same order as is required for CMMS Entry); updated PEG Type (add OHC, ENG deleted, and clarified Primary/Additional data entry); other lesser changes. Thanks to POC Tobin Oruch, Ryan Keyser for xls help, Melissa Zelic for PEG solution, Charlie Nuss (xls upkeep), Alan Yaeger, others.
Ch 5 - Structural	Section II	Posted Variance: VAR-10711, SDC-1, SDC-2, and Non-nuclear SSCs Seismic Parameter Increase; SDC C Elimination	-	12/12/2024	See "Seismic Design Parameters Update" article above

Ch 13 - Welding, Joining & NDE	Vol. 6	ITM-1306-NDE-PT-101, Visible Solvent Removable Penetrant with Non-aqueous Wet Developer	1	11/20/2024	Update to current ASTM E165 standard. Editorial changes. Thanks to NDE POC David Harvey.
Ch 13 - Welding, Joining & NDE	Vol. 6	ITM-1306-NDE-PT FM01, Penetrant Testing Inspection Report Form	1	11/20/2024	To be used for PT-101 and PT-201. Thanks to NDE POC David Harvey.
Ch 16 - Building Code Program	IBC-GEN, Att. B	Posted Variance: VAR-10711, SDC-1, SDC-2, and Non-nuclear SSCs Seismic Parameter Increase; SDC C Elimination	-	12/11/2024	See "Seismic Design Parameters Update" article above
Ch 16 - Building Code Program	Chapter References and Resources	Listing of LBO-Approved IBC Testing, NDE, and Inspection Agencies; Fabricators; and Products	-	12/2/2024	Added one NDE firm, removed another; thanks for NDE POC David Harvey. Subsequently, approved Energy Balance & Integration as a Third-Party Inspection Agency; thanks to Chief Inspector Robert Abeyta.
Ch 20 - Systems Engineering	-	ALDICP Graded Approach to Ch. 20 (Non-Nuclear under $100M) (LANL only)	-	9/30/2024	This document supplements ESM Chapter 20 to ensure proper requirements technical baseline is recorded, managed, traced, and validated adequately for applicable projects. This graded approach applies to ALDICP projects that have TCPs between $20M and $100 M and are not modifying or building Haz Cat 1-3 nuclear facilities. Thanks to PIE-3 for developing.

LANL Master Specifications STD-342-200

Thanks to Christina Salazar-Barnes for formatting these specification sections and Neha Gidwani for coordinating all these updates with the POCs!

Section Number	Rev.	Section Title	Date	Comments
All Specification Sections	-	Posted Variance: VAR-10711, SDC-1, SDC-2, and Non-nuclear SSCs	12/11/2024	See "Seismic Design Parameters Update" article above

		Seismic Parameter Increase; SDC C Elimination		
21 0500	0	Common Work Results for Fire Suppression	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Scott McMurtrey and Samuel Lariviere.
21 0523	0	General-Duty Valves for Water-Based Fire-Suppression Piping	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Scott McMurtrey and Samuel Lariviere.
21 0533	0	Heat Tracing for Fire Suppression Piping	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Scott McMurtrey and Samuel Lariviere.
21 1200	0	Fire-Suppression Standpipes	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Scott McMurtrey and Steven Ulibarri.
21 1300	0	Fire-Suppression Sprinkler Systems	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Fire Spec Alt POC Scott Waldman, Abigail Benoit and Steven Ulibarri.
21 2200	7	Clean-Agent Fire-Extinguishing Systems	12/5/2024	This revision includes a major update adopting content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Scott McMurtrey, Ralph Foster and Geraldo Mendez.
21 3000	0	Fire Pumps	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Fire Spec Alt POC Scott Waldman, Alejo Sztybel and Adan Casados.
26 2923	5	Variable-Frequency Motor Controllers	12/9/2024	This is a major revision that includes reducing submittal requirements for most applications, provides clarification with Multiple Input Ratings, encourages use of pre-approved LANL standard drive types, updated seismic mounting requirements to simplify field mounting of drives, new labeling requirements for drives and minor

				editorial updates. Thanks to I&C POC Allen Hayward, Eric Stromberg, Felix Sandoval, Jeff Fredenburg and Stuart Rector.
26 2933	0	Controllers for Fire Pump Drivers	12/5/2024	NEW! This section adopts content aligned with commercial industry practice. Thanks to Fire Spec POC Todd Smith, Eric Stromberg and Alejo Sztybel.
28 4600	5	Fire Detection and Alarm	12/10/2024	This revision includes clarifications, editorial changes, updated Part 1 related to Related Sections, References, Submittals, Design, Quality Assurance, added Definitions and Acronyms; updated Part 2 with approved parts and components for Fire Alarm systems; updated Part 3 to align with commercial industry and LANL practices for execution. Updated Appendix by replacing Deliverables for Fire Alarm System with Master Equipment List Reference. Thanks to Aaron Gabaldon, Keenan Dotson, Fire POC Shaun Wrightson and the FP Office.

CAD Standards Manual ESM STD-342-300

Section	Title	Rev.	Date	Comments
200	Posted Variance: VAR-10694, Project Drawing Package Approvals on Title Sheet; Fewer Signatures VAR-10694 Title Block Template (pdf) (dwg) VAR-10694 Title Sheet Template (pdf) (dwg)	-	11/19/2024	See "Standards Spotlight" article above Use the VAR-10694 Title Block and Title Sheet templates for reduced signature requirements. For small projects/tasks, use Title Block and Title Sheet templates (not for VAR-10694).
400	Revit Template 24 (.rvt) Revit Template 24 Shared Parameters (.txt) Revit Template 24 Master Keynotes (.txt)	0	11/19/2024	Thanks to BIM Stds POC Bruce Gunderson, BIM/CSM Alternate POC Brandon Rael, and CSM POC Michael Gallegos.

Standard Details and Example Drawings STD-342-400

Section	Title	Rev.	Date	Comments
All Standard Details and Example Drawings	Posted Variance: VAR-10711, SDC-1, SDC-2, and Non-nuclear SSCs Seismic Parameter	-	12/11/2024	See "Seismic Design Parameters Update" article above

	Increase; SDC C Elimination			

Tailored Standards Manual STD-342-600

Section	Title	Rev.	Date	Comments
Chapter 5 - Structural	Posted Variance: VAR-10711, SDC-1, SDC-2, and non-nuclear SSCs Seismic Parameter Increase; SDC C Elimination	-	12/11/2024	See "Seismic Design Parameters Update" article above

LANL Engineering Standards Admin matters

E-mail for COE Eng Stds: engstandards@lanl.gov
Click e-mail address above for any general questions. Goes to the whole team: Tobin Oruch, Alan Yaeger, Neha Gidwani and Christina Salazar-Barnes. Alternatively, visit the CoE or Engineering Standards webpage and click on the email under the Engineering Standards team. Of course, if your need is discipline-specific, then it's best to contact the Standards POC for the corresponding ESM chapter shown on that webpage.

LANL ENGINEERING PROCESSES CHANGES

Document	Title	Rev.	Date	Comments
AP-341-517-FM01	Design Change Form	2.3	11/25/24	"Change of Occupancy" has been incorporated into the IBC Review functional area in Section 4.0 of the form. This ensures that any modification to a design or designated use of a building, space, or facility reclassifies its occupancy classification to be compliant with IBC or other applicable standards. Thanks to AP Manager Azupuri Kaba and Eric Stromberg.

LANL Engineering Processes Admin matters

E-mail for COE Eng Processes: COE-APs@lanl.gov
Click e-mail address above for any questions related to Administrative Procedures. Goes to Azupuri Kaba (Kaba), Gabriel Herrera, Beau Portillo, and Christina Salazar-Barnes. Alternatively, visit the CoE or Engineering Procedures webpage and click on the email under the Engineering Processes team.

NATIONAL STANDARDS ACTION

Online National Codes & Standards (Accuris Eng Workbench [EWB], formerly IHS)

ACI 349-23, Nuclear Safety-Related Concrete Structures - Code Requirements and Commentary
Publication Date: 10/23/2024 (Note: LANL uses the previous edition)
Type of Change: Complete Revision

ACI 355.4, Post-Installed Adhesive Anchors in Concrete - Qualification Requirements and Commentary
Publication Date: November 2024 (Note: LANL uses a previous edition consistent with the concrete codes used)
Type of Change: Complete Revision

IEEE 80, Guide for Safety in AC Substation Grounding
Publication Date: 12/11/2013
Type of Change: Status Change (now Inactive)

NFPA 13-2025 AMD 3, Standard for the Installation of Sprinkler Systems
Publication Date: 8/29/2024
Type of Change: Amendment (NFPA calls these TIA; has been incorporated into main NFPA 13 file)
Note: This is an amendment to the 2025 edition; LANL is using NFPA 13-2019 edition per ESM Ch 2, Att 1, R1

DOE TECHNICAL STANDARDS ACTION

Tech Stds Program postings are listed on the Technical Standards Portal.

No updates this month.

MERRY SITHMAS

MSS DOCUMENT ACTION

Important Announcement: MSS has fully transitioned to housing and processing MSS documents in PDMLink/Windchill and will no longer be updating SharePoint or utilizing it in any way. All MSS Documents can be located on the MSS Document Library website located here: https://int.lanl.gov/org/ddops/aldfo/mss/resources/document-library/index.shtml

For ease of access a direct link to the library has been added to the MSS homepage.

Operation and Maintenance Criterion and related Preventative Maintenance Instructions (PMI) are standards with which system and plant engineers should be familiar. Implementation is required 30 days from issue date for non-nuclear facilities, 60 days for nuclear facilities. Questions? Contact the document author shown on its approval page.

Below are recent changes issued by Maintenance and Site Services Division per Jeremy Vonharders. Click here to access.

O&M 415 Rev 1: Above Ground Storage Tanks

- Transferred to current O&M template.
- Updated Section 3.0, *Acronyms and Definitions*.
- Added new roles to Section 4.0, *Responsibilities*, including Certified
- Added corrosive liquids to Section 5.1, *Precautions*.
- Inspector, NDT Examiner, and PM Inspector.
- Updated Section 6.0, *Requirements*, and attachments to conform with current codes and standards, including API, NFPA, NMAC, SP001, and SP031 (see Section 10.0, *References*, for specific codes/standards and editions used).
  Content was updated to include the following:
- Operations requirements updated to include:
  - Decommissioning ASTs;
  - Removing ASTs from service/temporary and permanent closure,
  - Permanent closure for tanks less than 1,320 gallons; and
  - Closure records.
- Maintenance requirements updated throughout, including, but not limited to:
  - Training qualifications for PM Inspectors and Certified Inspectors (6.2.1);

- Criteria for AST inspection frequencies (6.2.3);
- Monitoring for water accumulation and how to remove water from ASTs (6.2.7);
- New FEI requirements for CE-ASTs, fire water ASTs, and miscellaneous ASTs subject to corrosion (6.2.8); and
- New FII requirements for vertical and rectangular ASTs (6.2.9).

- Removed table from Section 9.0, *Required Documentation*.

- Updated Section 10.0, *References*.
- Added new attachment, Attachment 2, *Record Keeping (NMAC 20.5.110.1015)*.

PMI 506-C Rev 2: Backup Generator Level 2 Systems Inspection, Testing and Maintenance

- Template change.
- Updated to 2022 NFPA 110.
- Added block heater/jacket coolant heater note in Section 4.0, Cooling System, in all checklists.
- Added battery replacement note to Section 6.0, Battery System, in all checklists.
- Added Megger test to Section 8.0, Engine (Prime Mover) and Alternator, in checklists 506-C.004, *Yearly Inspection, Testing, and Maintenance,* and 506-C.005, *3-Year Inspection, Testing, and Maintenance.*

O&M 710 Rev 5: Foam-Water Sprinkler Systems

- Updated NFPA references to latest editions, including NFPA 25.
- Added accelerator facilities to list of nuclear, high-hazard, and explosive facilities in Section 5.2, *Limitations, and* Section 6.0*, Nuclear, High-Hazard Non-Nuclear, and "High Value" Facilities*.
- Added definitions for Film-Forming Fluoroprotein Foam Concentrate (FFFP), Fluoroprotein Foam Concentrate, Foam-Water Deluge System, Foam-Water Dry Pipe System, Foam-Water Preaction System, and Foam-Water Spray System.
- Changed Section 6.0, Requirements, note to only state that the discovery of degraded or non-conforming conditions require appropriate FOD operations and system engineering personnel.
- Labeled attachments from A through C to 1 through 3 in accordance with latest template.
- Added Section 6.1.2, *Operations Functions*, with descriptions of each function.
- Moved Weekly Inspections sections from Maintenance Requirements to Operations Requirements.
- Updated Table 6-2, *Inspection, Testing, and Maintenance Frequencies*, with current callout sections and frequencies within NFPA 25.
- Added appropriate headings within Section 6.2.1, *Monthly Inspections*.
- Added steps for proportioning system components, standard pressure proportioner, and bladder tank proportioner.
- Changed content throughout from passive to active voice.
- Added Section 6.2.6, *Semiannual Maintenance.*
- Added steps for foam concentrate storage in Section 6.2.7, *Annual Inspections*.
- Added steps for Section 6.2.8, *Annual Testing*.
- Added Foam Concentrate Pumps heading for Section 6.2.12, *Five-Year Maintenance*. Added two additional steps for the same section.
- Added Pressure Vacuum Vents for Section 6.2.12, *Five-Year Maintenance.*

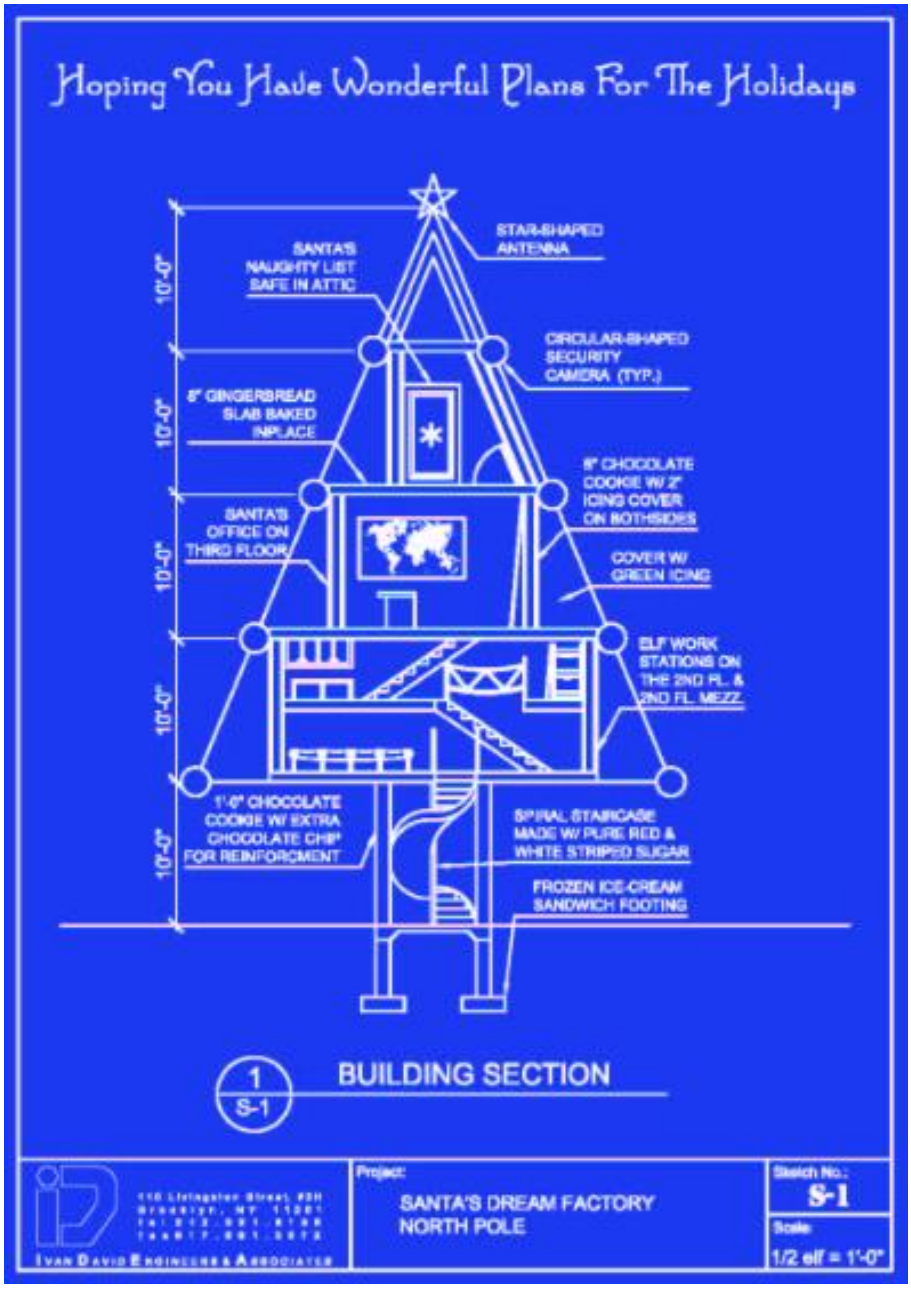
- Revised Section 8.0, *Implementation Guidance*, for prevention of redundant program development and implementation.
- Removed Section 9.0, *Required Documentation*, in accordance with latest template.
- Added new references to Section 9.0, *References*.
- Revised Attachment 1, *Component and System Action Requirements*, in accordance with Table 5.5.1 of NFPA 25.

O&M 720 Rev 6: Fire Alarm Systems

- Migrated to current template.
- Updated code references to conform to updated NFPA requirements.
    - NFPA 25 (2023 edition)
    - NFPA 72 (2022 edition)
- Revised Attachments 1, 2, and 3 to reflect current NFPA 72 requirements.
- Removed "High Value" Facility ITM List from Attachment 4.
- Added Attachment 5, *"High Value" Facility ITM List.*
- Updated Attachment 5 to reflect ADNHHO-18-061, "High Value Facility ITM List," Revision 8, changes.
- Removed Required Documentation section.

O&M 800 Rev 2: Predictive Maintenance

- Updated to current O&M template.
- Updated to reflect current reliability protocols in general industry per ANSI/ASNT CP-105-2020; ANSI/ASNT CP-189-2020; ISO 18436-2:2014 throughout.
- Updated Section 2.0, Scope, to clarify corrective maintenance scheduling is based on the condition of the equipment through data analytics, not a preset schedule.
- Updated Section 3.0, Acronyms and Definitions.
- Added a list of precautions to Section 5.1, Precautions.
- Clarified in Section 6.1, Operations Requirements, that only designated Operations personnel may perform equipment operations (removal and return-to-service) while performing any PdM activity.
- Added basis statements to Sections 6.1, 6.2, and 7.1.
- Added new technologies and applications to Table 7-1, Common Predictive Technology Applications.
- Deleted Required Documentation section.
- Updated Section 9.0, References.


Hoping You Have Wonderful Plans For The Holidays
STAR-SHAPED ANTENNA
SANTA'S NAUGHTY LIST SAFE IN ATTIC
CIRCULAR-SHAPED SECURITY CAMERA (TYP.)
8" GINGERBREAD SLAB BAKED INPLACE
8" CHOCOLATE COOKIE W/ 2" ICING COVER ON BOTHSIDES
SANTA'S OFFICE ON THIRD FLOOR
COVER W/ GREEN ICING
ELF WORK STATIONS ON THE 2ND FL. & 2ND FL. MEZZ.
1'-0" CHOCOLATE COOKIE W/ EXTRA CHOCOLATE CHIP FOR REINFORCMENT
SPIRAL STAIRCASE MADE W/ PURE RED & WHITE STRIPED SUGAR
FROZEN ICE-CREAM SANDWICH FOOTING
10'-0"
10'-0"
10'-0"
10'-0"
10'-0"
1
S-1
BUILDING SECTION
Project:
SANTA'S DREAM FACTORY
NORTH POLE
Sketch No.:
S-1
Scale:
1/2 elf = 1'-0"
IVAN DAVID ENGINEERS & ASSOCIATES

WHEN GOOD CONDUCT OF ENGINEERING ISN’T FOLLOWED

Major Warning Signs of Arecibo Telescope Collapse Were Missed, Report Finds

The National Academies' report on the 2020 collapse of the Arecibo Observatory in Puerto Rico identifies the primary cause as "zinc creep," a process where prolonged deformation of zinc used in anchoring steel cables caused them to slip from their sockets, leading to the structural failure. Despite clear warning signs over several years, including post-Hurricane Maria inspections that documented cable socket deterioration, these were not adequately addressed. The report attributes this oversight to a lack of maintenance prioritization, funding reductions, and insufficient structural monitoring as the facility aged.

The collapse, which followed earlier cable failures and structural stress from Hurricane Maria in 2017, was deemed inevitable by the time of its occurrence. The key takeaway from this structural failure is that building and operating cutting-edge, custom designed research facilities presents unique challenges, where prior designs and experience may not necessarily be a reliable guide for safe designs and predicting unprecedented modes of failure; however, careful structural monitoring should be increased as facilities age to detect deterioration and potential novel failure modes, to the extent that is reasonable.

LAST MONTH'S UPDATE TOPICS

Miss an issue? The archive is at "Monthly Update" on the Standards homepage. Last month's topics:

- AGS and Laser Safety Standards Available Through Research Library
- New Fire POC
- Training & Qualification
- LANL Engineering Standards Issued in October
- LANL Engineering Processes Changes
- National Standards Action
- DOE Technical Standards Action
- MSS Document Action
- When Good Conduct of Engineering Isn't Followed